

Abstract

Titanium oxide-based photocatalysts which contain a metal halide in titanium oxide and which are prepared from titanium oxide and/or its precursor, which may optionally be heat treated, by contact with a reactive gas containing a metal halide of the formula MX_n or MOX_n (wherein M = a metal, X = a halogen, and n = an integer) with heating stably develop a high photocatalytic activity with visible light irradiation. The photocatalysts may subsequently be stabilized by contact with water or by heat treatment, and/or promoted by contact with a heteropoly acid and/or an isopoly acid so as to include a metal complex in the titanium oxide.

Photocatalysts prepared in this manner exhibit novel ESR features. The present invention also provides methods for preparing these photocatalysts, a photocatalyst dispersion and a photocatalytic coating fluid containing such a photocatalyst, and photocatalytic functional products and methods for their manufacture using the photocatalyst.